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Promoting Safe Administration of Intravenous Push Medications: An Interprofessional, Evidence-Based Patient Safety Initiative

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Introduction

There are numerous risks associated with the preparation and administration of intravenous (IV) push medications. One particular practice that increases the risk for error and can lead to patient injury is the often unnecessary practice of diluting medications prior to IV push administration.

Significance

Potential risks associated with unnecessary dilution of medications prior to IV push administration include:

- **Medication Errors**
  - Lack of standard dilution practices leads to variability in final drug concentration, potential drug instability, or compatibility issues.
  - Use of pre-filled normal saline syringes as diluent coupled with lack of labeling may lead to the inadvertent administration of medication instead of saline.
- **Contamination**
  - Excess manipulation increases risk for contamination.
  - Ready to use syringes and prefilled cartridges are designed for direct administration.
- **Diversion**
  - Variation in dilution practices may mask signs of drug diversion.
- **Regulatory Risk**
  - Centers for Medicare & Medicaid Services (CMS, 2015) have very specific regulations pertaining to the preparation of medications outside the pharmacy.

In many cases, the practice of diluting medications prior to IV push administration is based on tradition rather than evidence, outdated or inaccurate reference materials, or a misconception that dilution somehow improves safety and minimizes side effects.

Objectives

- Form a collaborative pharmacy-nursing task force to address dilution practices for adult patients:
  - Develop evidence-based recommendations to address the preparation and administration of IV push medications.
  - Improve safety and minimize risk associated with IV push medication administration.
  - Eliminate dilution when it is not indicated or supported by evidence.
  - Develop specific instructions for medications requiring dilution.

Methods

- **Form an Interprofessional Taskforce**
  - Interprofessional Team of Nurses & Pharmacists
    - Nurse Practice Forum Representatives
    - Cross-Divisional/Cross-Continuum Representatives
    - Clinical, Safety, & Regulatory Pharmacy Specialists
- **Determine Baseline Practice**
  - Observation/Interview/Survey
    - Confirmed variability in practice
    - Uncovered driving forces behind dilution practices
    - Validated need to establish recommendations
- **Review Literature/Guidelines/Regulations**
  - Institute for Safe Medication Practices (ISMP): Safe Practice Guidelines for Adult Intravenous Push Medications (2015)
  - Infusion Nurses Society (INS): Infusion Therapy Standards of Practice (2016)
  - CMS Regulations (2015)
  - APIC: Safe Injection, Infusion, and Medication Vial Practices in Health Care (2016)
  - Gahart (2016) Intravenous Medications: A Handbook for Nurses and Health Professionals
  - Specialty –specific guidelines & standards
- **Establish Recommendations**
  - Do not routinely dilute medications prior to IV push administration unless specified in the administration instructions.
    - Build dilution panel for meds requiring dilution
    - Revise administration instructions on the MAR
  - Do not use pre-filled normal saline syringes as diluent.
    - Create a link in Omnicell® to diluent vials
    - Adjust par levels of NS syringes & vials
  - Do not routinely remove medications from prefilled syringes or medication cartridges.
    - Distribute Carpuject™ holders to all nurses
    - Develop specific instructions for cases of exception
  - Use appropriate size syringe for medication delivery.
    - Review INS recommendations for flushing/establishing patency of central lines
    - Emphasize the importance of following IV push meds with a flush, at the same rate as the medication administration, with quantity sufficient to clear the line
- **Develop Education and Sustainment Plan**
  - Education Toolkit: Dispel Myths & Inform of Risks
  - Audit Tool: Monitor uptake of recommendations
  - Hand-Off to Clinical Practice Forums & Medication Utilization Safety Improvement Committee (MUSIC)

Expected Outcomes

- **Standardized Dilution Practices**
  - Limit the practice of dilution based on published guidelines and pharmacy recommendations
  - Reduce variation in practice as specific, evidence-based instructions are now provided when indicated
  - Avoid potential stability and/or compatibility issues
- **Improvement in Patient Safety**
  - Lower the risk of medication error
  - Reduce risk of contamination as a result of less manipulation
  - Coordinate efforts to align recommendations with revised flushing guidelines for vascular access devices
- **Meet Regulatory Requirements**
  - Ensure compliance with revised CMS regulations for the preparation and administration of medications
  - Reduce risk of non-conformity to established standards

Conclusion

- **Safe Medication Practices Reduce Risk**
  - Uncover variations in practice to identify priorities.
  - Provide evidence-based recommendations to improve practice and minimize risk.
  - Involve key stakeholders from the beginning and address all concerns.
- **Recommendations for Practice**
  - Establish safe IV medication practice standards.
  - Incorporate into competency validation.
  - Consider annual review and periodic assessment.
  - Clarify myths and present evidence to support changes in practice.
  - Continue to monitor and coach as needed.

SAFETY FIRST!

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